REMARKS

I. Summary of the Office Action and this Reply

Claims 16-46 are pending. The Examiner has rejected claims 16-46 under 35 U.S.C. §103(a), asserting that such claims are obvious over U.S. Patent No. 5,411,564 to Bolin ("Bolin") in view of U.S. Patent No. 6,170,294 to Mann et al. ("Mann").

In this Reply, claims 16, 23-26, 31 and 43-45 have been amended. No new matter has been added; support for the amendments can be found, inter alia, in the original application at page 1, lines 28-32; page 7, lines 5-19; and page 6, lines 12-32.

II. Discussion of the Cited Art

Bolin discloses a pneumatic plunger mechanism for a glassware forming machine. The plunger mechanism 20 forms an initial opening 42 in a parison 28 prior to its transfer to the blow mold 39. Either a blow-and-blow plunger mechanism 50 (see Fig. 4), or a press-and-blow plunger mechanism 52 (see Figs 5-7) may be used.

The plunger mechanism 20 is suspended in a plunger case assembly 22 from the frame of the machine to avoid the problems associated with a support foot. Col. 19, lines 20-23. The plunger case assembly 22 allows the plunger mechanisms 20 to be easily interchanged or replaced, to be adjusted to accommodate different types of operation and sizes and configurations of glass article produced, while still communicating pressurized air to the plunger mechanisms to achieve these effects. Abstract.

More specifically, the plunger mechanisms 20 of the plunger case assembly 22 may be adjusted vertically, to allow neck rings 34 to seat with blank mold halves 32

while accommodating differently sized plunger mechanisms 20, which may be substituted for one another as desired. Col. 20, lines 36-42. This basic vertical adjustment is accomplished by driving a shaft 250 that rotates gears 246, 248 and causes rotation of threaded rods 223, 224. Rotation of the rods 223, 224 advances threaded blocks 234 up or down the rods, and causes the base plate 222 and plunger mechanisms 20 mounted thereon to move vertically. Col. 20, lines 23-36.

After such vertical adjustment, the plunger mechanisms are properly positioned to mate with the mold halves 30 to form parisons 28, without any further movement or adjustment for a given mold. After such vertical adjustment, the plunger mechanisms 20 are operated to form the parisons 28. Operation of the plunger mechanisms 20 to form the parisons 28 does not involve any use of the threaded rods 223, 224. Instead, for example, operation of a plunger mechanism 20 may involve use of pressurized air to move a plunger piston 68 and associated plunger 202 into a glass gob 27 to form the parison 28. See Figures 9, 10 and 11; col. 17, lines 50-65. The plunger 202 may be retracted and the process may be repeated by application of compressed air, without any adjustment via the rods 223, 224. See col. 18, lines 5-68.

III. Response to 103 Rejections

A section 103 rejection is proper only if all claim limitations are taught or suggested by the cited art. MPEP §2143.

Claims 16

Independent claim 16 is directed to a pressing plunger mechanism for a

glassware forming machine. The pressing plunger mechanism 1 includes a fixed housing 31 mountable on the glassware forming machine, a movable housing 8 mounted on the fixed housing 31, and a plunger holder 45/46 movably mounted on the movable housing 8. The pressing plunger 72 is supported on the plunger holder 45/46.

The pressing plunger mechanism 1 includes a drive unit 9 mounted on the movable housing 8. The drive unit 9 includes a threaded spindle 17 fixedly attached to the plunger holder 45/46 and a nut 21 engaged with the spindle, the nut being coupled to a driven shaft 15. The driven shaft 15 has a first bevel gear 87 mounted thereon, the first bevel gear 87 engaging a second bevel gear 14 mounted on a drive shaft 13 of an electric motor 10. Rotation of the drive shaft 13 of the electric motor rotates the nut 21 and thereby moves the spindle 17 in a lengthwise direction. Lengthwise motion of the spindle moves the plunger holder 45/46 relatively to the movable housing 8, and thus moves the pressing plunger 72 supported thereon, to form a parison. As described in the application, "in each working cycle, the first drive 9 ensures that the . . . pressing plunger holders 45, 46 adopt a lower inoperative position, a middle loading position and an upper pressing position." Substitute Specification, page 7, lines 5-7.

The '564 patent relies upon compressed air/a pressure medium drive to move the pressing plunger, as described above. As stated in the substitute specification, at page 1, lines 21-23, "precise movement control with a pressure medium drive is barely possible or is only possible at great expense." Accordingly, as stated at page 1, lines 25-26, "[i]t is an object of the invention to simplify and to render more precise the linear drive of the pressing plungers while taking up a small amount of space."

Accordingly, as described above and in contrast to the compressed air-based

drive described in the '564 patent, the claimed invention relies upon an electric motor and gear train to mechanically advance the pressing plunger to form the parisons during the glassware forming machine's working cycle. More specifically, the electric motor 10 of the drive unit 9 drives bevel gears and rotates a nut 21 that is coupled with spindle 17. Rotation of the nut moves the spindle lengthwise, and advances the cylinder/piston and attached pressing plunger 72. This compact and precise drive mechanism has an entirely different principle of operation from that of pressure medium drive of the '564 patent.

Further, the Examiner asserts that Bolin discloses the claimed nut. More specifically, the Examiner asserts in paragraph 2 of the Action that the threaded blocks 234 of Bolin are the claimed nut. Applicants respectfully traverse. Claim 16 clearly requires "rotation of said drive shaft of said electric motor rotating said nut . . . . " Accordingly, in the claimed invention, the nut is caused to rotate, causing the threaded spindle, which does not rotate, to move in a lengthwise direction. In contrast, Bolin discloses that the threaded block 234 is "rigidly retained in correspondingly shaped square holes 236 located in the upper base plate 222 . . . The square or rectangular configuration of the threaded blocks 234 in the holes 236, 238 prevents them from rotating with rotation of the threaded rods 223 and 224." Col. 19, line 61 – col. 20, line 2. Accordingly, the threaded block 234 of Bolin does not rotate, and cannot be the claimed rotating nut. Further, Bolin operates according to a principle of operation in which the spindle 223, 224 rotates, and thus the nut must not rotate according to provide the longitudinal motion desired. Modifying Bolin to permit the block 234 to rotate would render the block and/or height adjustment mechanism inoperable for its

intended purpose, because rotation of the spindle and the block together would not provide for relative motion and lengthwise motion providing the height adjustment. Further, modifying the Bolin mechanism to rotate the block and hold the spindle fixed would change the principle of operation of the Bolin device. Accordingly, there cannot be motivation to modify the Bolin device to arrive at the claimed invention.

Additionally, it is noted that the mechanism of the '564 patent that drives spindles 223, 224 is inapposite as it relates to providing a basic height adjustment of the plunger mechanisms as a whole during initial set-up of the machine, but does not relate to reciprocation of the pressing plunger during the working cycle of the plunger mechanisms/pressing plungers to form parisons. Accordingly, the cited mechanism of the '564 patent is somewhat analogous in overall function to the second drive 39, in that it provides a basic height adjustment as part of a set-up process to form glassware having certain dimensions (see application, page 6, lines 12-17), although the structure of the second drive 39 is different from that of the spindle-based height adjustment mechanism of the '564 patent. Both of these drives are entirely unrelated to the function of the claimed mechanism, which relates to operation of the plunger mechanism itself during a working cycle to form parisons, and not to height adjustment/positioning of the plunger mechanisms during an initial set-up process.

Further, the proposed addition of the electric motor of Mann to the spindle-based height adjustment mechanism for the plunger mechanisms of Bolin does not provide the claimed invention, which relates to a spindle-based drive mechanism for operation of the plunger mechanisms, e.g., to form a parison.

For at least these reasons, reconsideration and withdrawal of the rejection of

claim 16 are requested respectfully.

Claims 17-46

Claims 17-46 depend from claim 16 and are likewise patentable for the reasons set forth above.

Claims 23, 24 and 25 further recite a longitudinally divided split ring 73 supporting the pressing plunger 72, and a support cylinder 47, 48 mounted on the movable housing 8. These claims further recite that the split ring is movable within and radially supported by the support cylinder. See page 6, line 27 – 32. This arrangement allows the split ring to ride in the support cylinder and to be used as intended during normal operation. Further, this arrangement permits the pressing plunger 72 to be changed by moving the split ring 73 out of the support cylinder 47, 48, so that it is no longer radially supported by the support cylinder, to permit the split ring portions to be opened/separated for replacement of the pressing plunger 72. Page 7, lines 15-19; Fig. 1. This is neither taught nor suggested by the cited art, particularly Bolin. In contrast, Bolin discloses a neck ring 34, each half of which is fixed to a separate portion of an invert arm 36. Col. 7, lines 39-47. The neck ring is not movable within a cylinder, as claimed. For at least this additional reason, reconsideration and withdrawal of the rejections of claims 23-25 are requested respectfully.

Claims 26 and 31 further recite a cylinder and piston assembly mounted on said plunger holder, said piston . . . being movable within said cylinder relatively to said plunger holder, and an evaluation circuit for determining an axial position of said pressing plunger. The evaluation circuit makes the determination as a function of a

determined position of the piston, determined in part by a displacement pick-up. This is neither taught nor suggested by the cited art.

Claims 38 and 39 are directed to a clamping device mounted on the fixed housing and engageable with the support cylinder on the movable housing for fixing the position of the movable housing relatively to the fixed housing. Contrary to the Examiner's assertion in paragraph 11 of the Action, this is neither taught nor suggested by the prior art. The clamping structure of Mann cited by the Examiner (see col. 9, lines 5-25; Figure 14) is inapposite; it does not relate to fixing the position of a movable housing relative to a fixed housing, as claimed. Instead, the Mann device relates to a clamping mechanism for clamping ducts that are supplied with pneumatic services, cooling air, process air, lubrication and process vacuum, etc. Col. 8, lines 64—66. There is no motivation to apply Mann's clamping structure as claimed, and further it is not at all clear that Mann's clamping structure could be applied as claimed. Mann's mere disclosure of a different clamping structure for a different purpose is insufficient to render the claimed invention obvious. The Examiner has not established a prima facie case of obviousness.

For at least these reasons, reconsideration and withdrawal of the rejection of claim 17-46 are requested respectfully.

CONCLUSION

In view of the foregoing amendments and remarks, Applicants believe claims 16-46 to be patentable and the application in condition for allowance, and request

respectfully issuance of a Notice of Allowance. If any issues remain, the undersigned requests a telephone interview prior to the issuance of an action.

Respectfully submitted,

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